ORDER NO. SD82092306C2

Service Manual

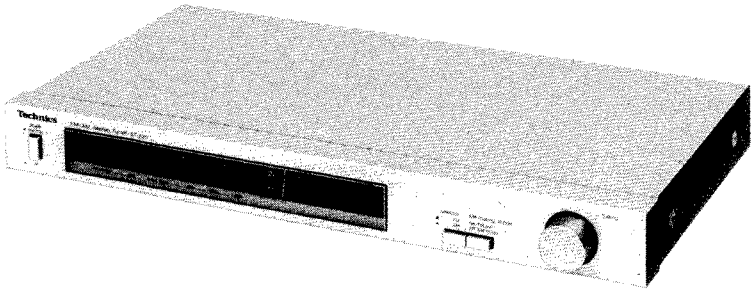
FM/AM Stereo Tuner

ST-Z25

[EGA]

ST-Z25(K)

[EGA]



* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Area

* [EGA] is available in F.R. Germany.

TECHNISCHE DATEN

Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	87,5 ~ 108 MHz
Eingangsempfindlichkeit	1,5 μV (nutzbar nach IHF, 75 Ω)
S/R 30 dB	1,3 μV (75 Ω)
S/R 26 dB	1,2 μV (75 Ω)
S/R 20 dB	0,9 μV (75 Ω)
Stereoumschaltschwelle bei 46 dB nach IHF	28 μV/75 Ω
Gesamtklirrfaktor	
Mono	0,2%
Stereo	0,3%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF)
Stereo	65 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+0,5 dB ~ −1,5 dB)
Trennschärfe bei Störsender	
normal (±400 kHz)	65 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	70 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
MW-Unterdrückung	50 dB
Übersprechdämpfung	
1 kHz	40 dB
Trägerrest	
19 kHz	−60 dB (−60 dB nach IHF)
38 kHz	−60 dB (−60 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,9 μV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	525 ~ 1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	20 μV, 300 μV/m
Trennschärfe (±9 kHz)	27 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	40 dB
ZF-Dämpfung bei 1000 kHz	65 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,54 V (0,9V, IHF)
Leistungsaufnahme	8W
Netzspannung	Wechselstrom 50 Hz, 220V
Abmessungen (B×H×T)	430 × 53 × 251 mm
Gewicht	3,0 kg

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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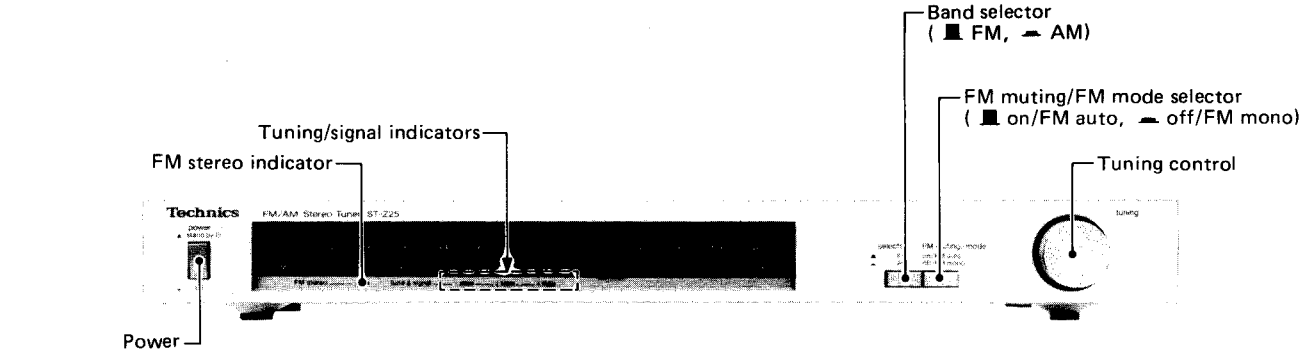
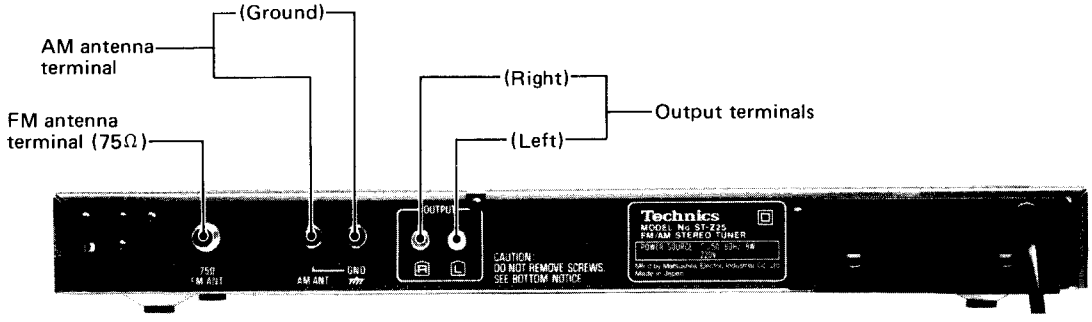
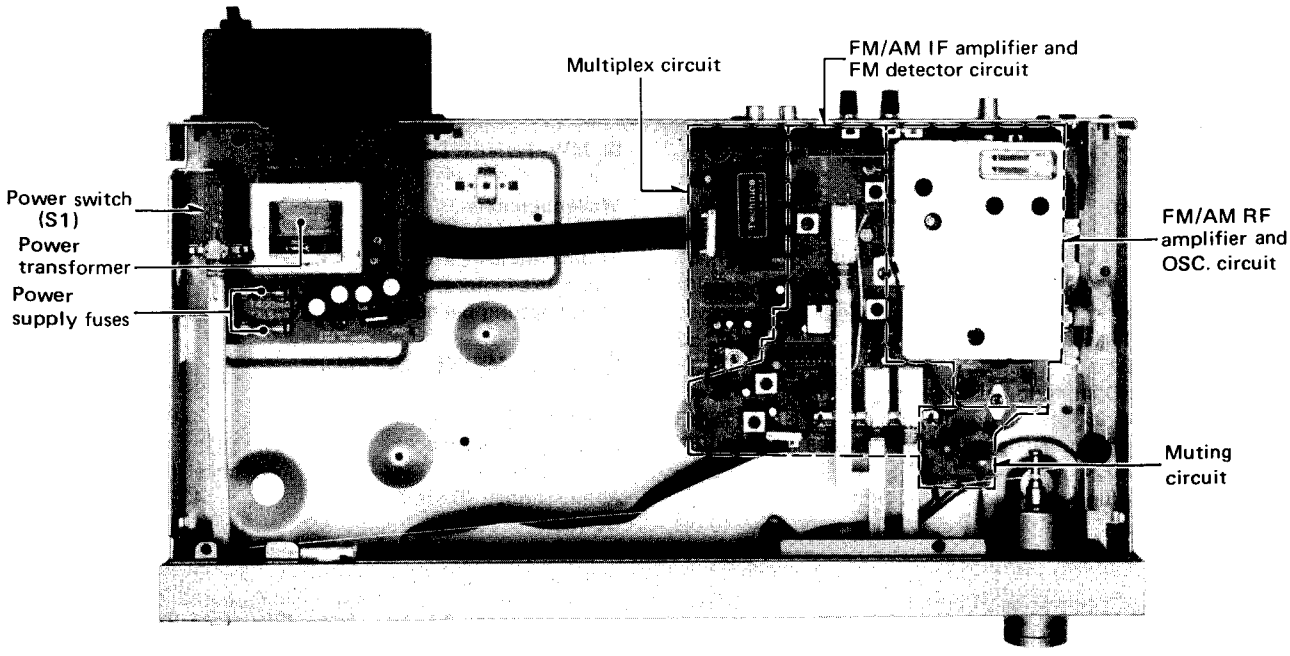
■ LOCATION OF CONTROLS



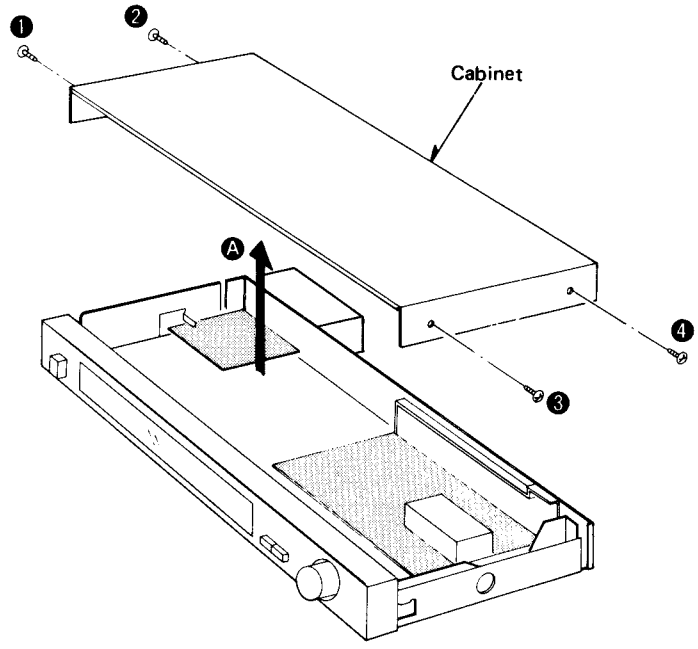




■ DISASSEMBLY INSTRUCTIONS

• How to remove the cabinet

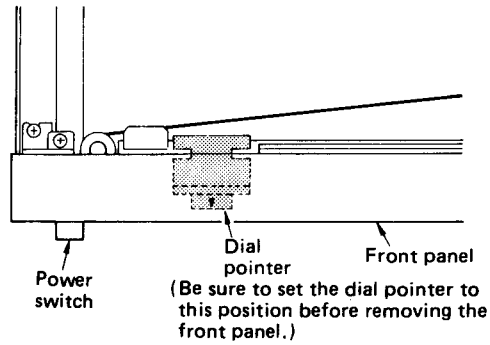
1. Remove the 4 setscrews (Fig. 1 : ❶ ~ ❹) on the cabinet.
2. Move the cabinet in the direction of the arrow Ⓐ in Fig. 1.



[Fig. 1]

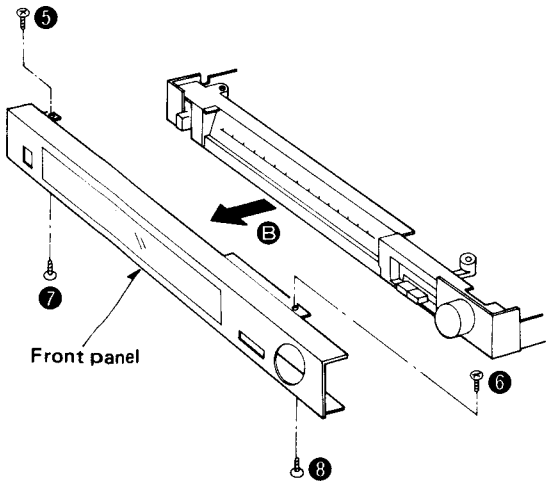
• How to remove the front panel

1. Remove the cabinet and set the dial pointer to the position as in Fig. 2. (Removing the front panel without setting the dial pointer to the position may cause damage to the dial pointer.)



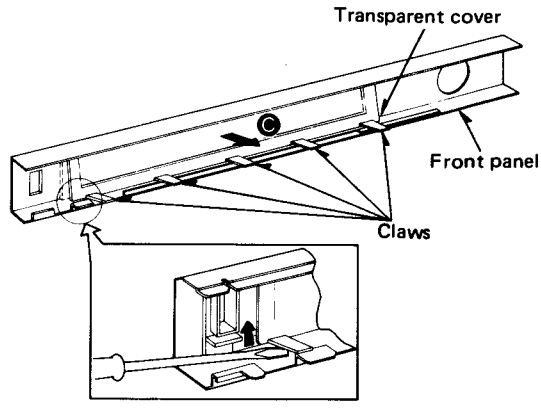
[Fig. 2]

2. Remove 4 setscrews of the front panel (Fig. 3 : ❺ ~ ❽) and remove the front panel in the direction of arrow Ⓑ.



[Fig. 3]

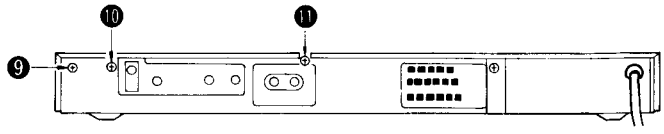
3. When removing the transparent cover, release the 5 claws with a screwdriver (See Fig. 4), and remove the transparent cover in the direciton of arrow Ⓒ.



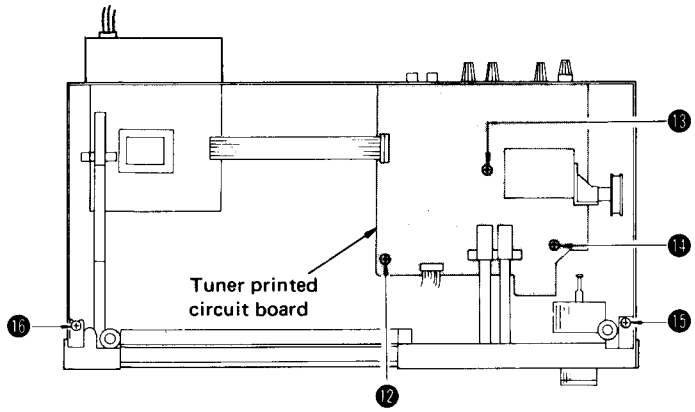
[Fig. 4]

- **How to remove the tuner printed circuit board**

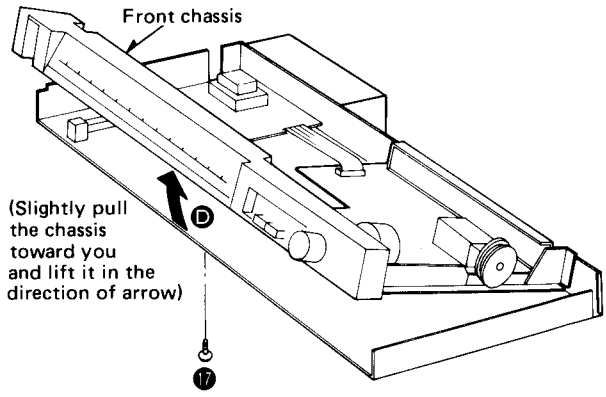
1. Remove the cabinet and front panel.
2. Remove 3 setscrews of the bracket and terminal board (Fig. 5 : ❾ ~ ⓫), 3 setscrews of the printed circuit board (Fig. 6 : ⓬ ~ ⓮), and 3 setscrews of the front chassis (Fig. 6 : ⓯ , ⓰ and Fig. 7 : ⓱).
3. Slightly pull the front chassis toward you and remove the printed circuit board in the direciton of arrow Ⓓ. (See Fig. 7)



[Fig. 5]



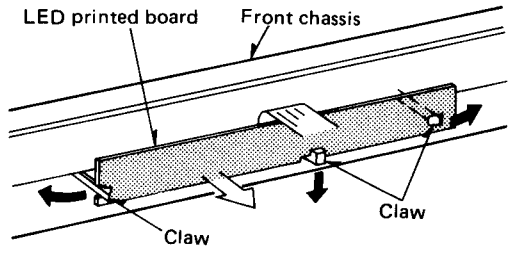
[Fig. 6]



[Fig. 7]

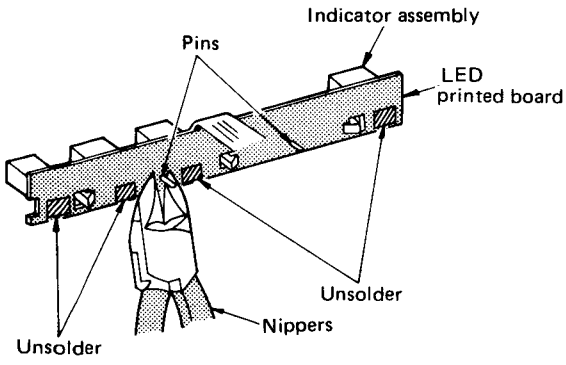
- **How to remove FM stereo tuning signal indicator**

1. Remove the cabinet.
2. Replace 3 claws of the LED printed board (Fig. 8) and remove the LED printed board from the front chassis.



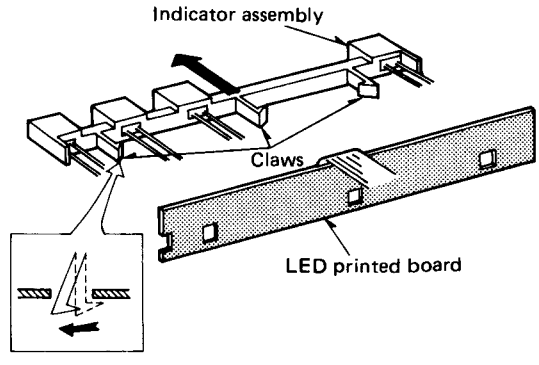
[Fig. 8]

3. Unsolder 4 portions of the indicator assembly and cut off the 2 pins connected to the indicator by use of nippers. (See Fig. 9)



[Fig. 9]

4. Release 3 claws of the indicator assembly and remove the indicator from the LED printed board. (Fig. 10)

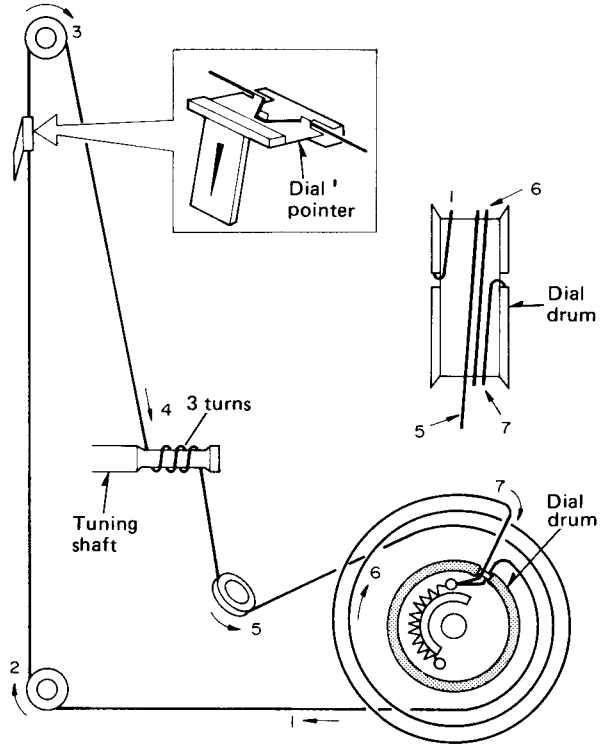


[Fig. 10]

■ DIAL CORD INSTALLATION GUIDE

For threading a fresh cord, proceed as follows.

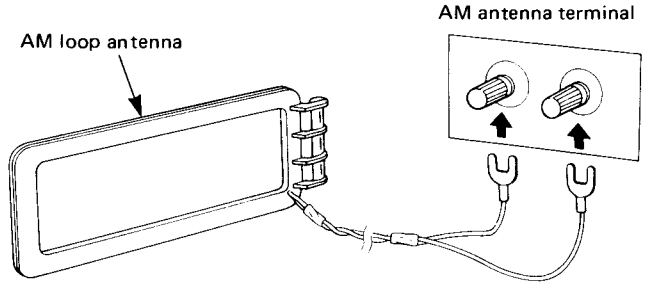
1. Prepare a fresh cord more than 180 cm (70-15/16") in length.
2. Bring the variable capacitor into a state where the drum is completely turned to the right (maximum capacity and lowest frequency for the variable capacitor).
3. Direct the cord in the order from 1 to 7.
4. Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
5. Fix the knot of the cord with the bond.



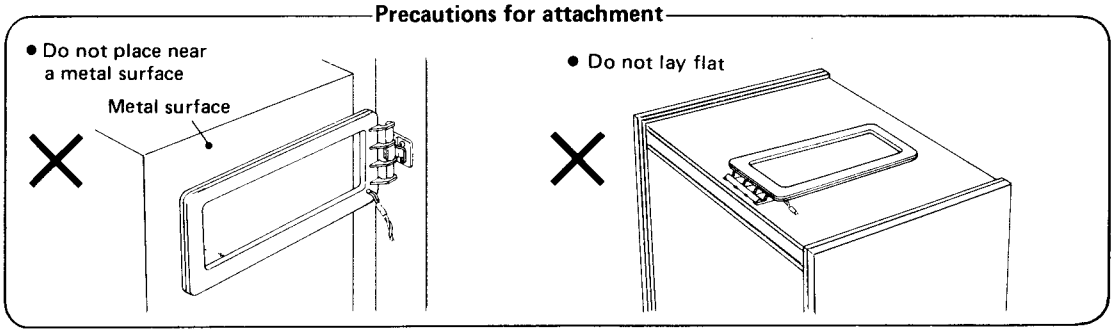
[Fig. 11]

■ AM LOOP ANTENNA

Since the unit does not employ the conventional AM bar antenna, be sure to connect the AM loop antenna to the AM antenna terminal on the back of the set when receiving AM antenna terminal. When the AM loop antenna is connected to the rear panel, place it as far away from the set as possible to improve the sensitivity.



Precautions for attachment



■ BEFORE STARTING THE REPAIRING

The power switch of this unit is connected to the secondary side of the power transformer, Be sure to pull the power cord out of the socket before repair.

■ MESSUNGEN UND JUSTIERUNGEN

(Für Deutschland)

- Beim Abgleichen der hohen Frequenz ist zuerst die Spule abzugleichen (Abgleich der niedrigen Frequenz), und dann allmählich der lose Trimmer anzuziehen, um den Abgleich der hohen Frequenz vorzunehmen. Für den Abgleich der Oszillationsspule und des ZFT ist ein nichtmetallischer Schraubenzieher zu verwenden.
- Den Anzeiger vor dem Abgleich unbedingt auf den Startpunkt einstellen. (Siehe Abb. 12)

• **Stellungen und zu benutzende Geräte**

1. Elektronische Voltmeter für Wechsel-und Gleichstrom (VTVM).
2. AM (MW)-Meßsender (AM-SG)
3. UKW-Meßsender (FM-SG)
4. Oszilloskop
5. Signalfrequenzmesser (meßbar für 19kHz und 108MHz).
6. Bereichsschalter . . . . . AM (MW Abgleich)
   FM (UKW Abgleich)
7. FM Muting/Mode Schalter. . . . . off/FM mono.
8. Die Netzspannung auf ihren Sollwert einstellen.
9. UKW-Kunstantenne, 75 ohm . . . Vgl. Abb. 13.
10. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute ablesung.

• **Vorbereitung AM UKW-Messender (FM-SG)**

1. Stereo-Modulator an FM-SG anschließen.
2. SG-Ausgang über 75-ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträt 60 dB (1mV), 400 Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

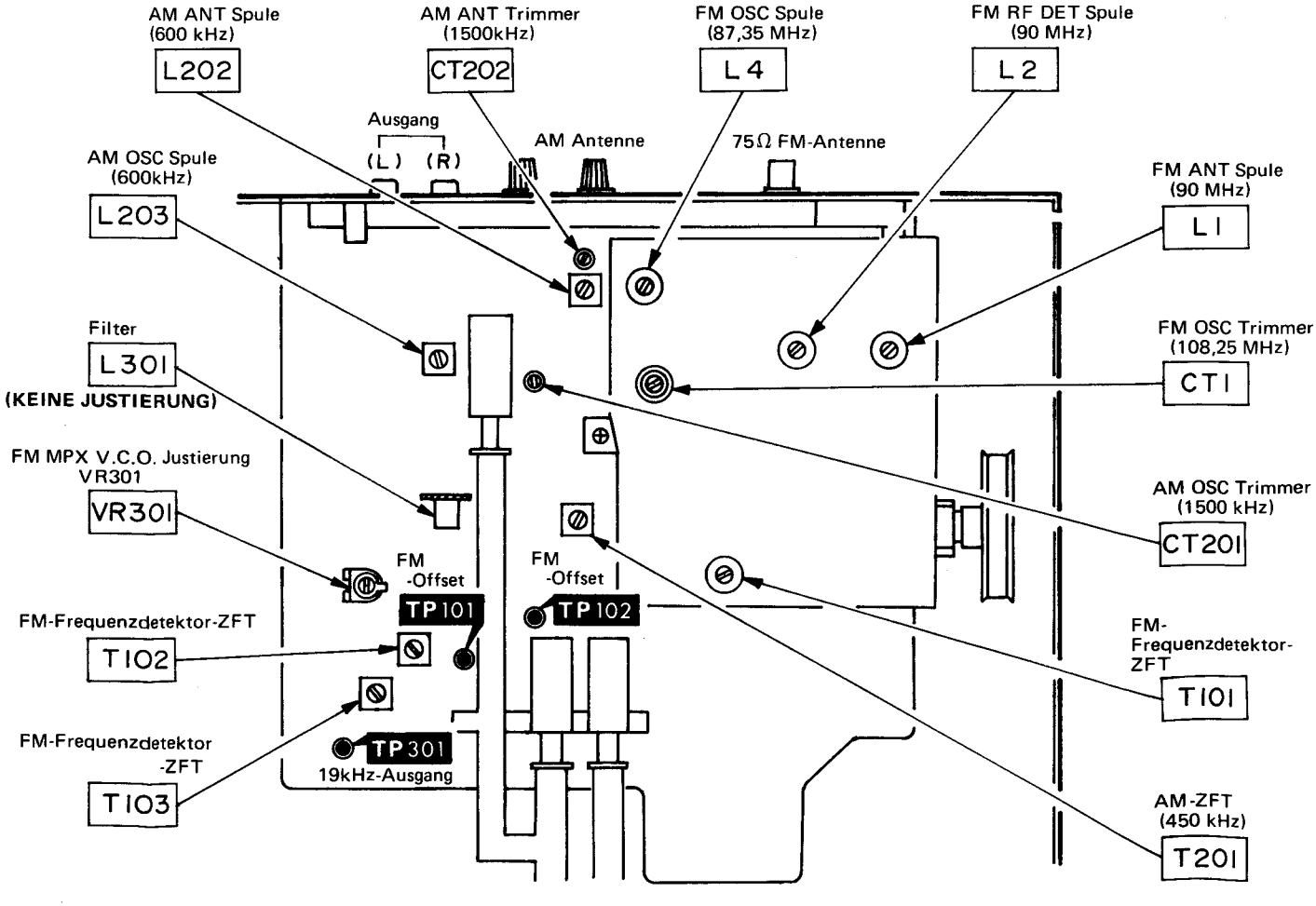
Nr.	AM/UKW MESSENDER ANSCHLUSS	AM/UKW MESSENDER FREQUENZ	SKALENZEIGEREINSTELLUNG DES TUNER	ANZEIGEGERÄT (Röhrenvoltmeter order Oszillograph)	ABGLEICHSPUNKTE	BEMERKUNGEN
	AM (MW)-ZF-ABGLEICH					
1	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400 Hz Modulat., 30%)	Kein Empfang	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	T201 (1. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adustieren, daß der Ausgang den maximalen Wert erreicht.
	AM (MW)-HF-ABGLEICH					
2	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	600kHz (400 Hz Modulat., 30%)	600kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	L203 (Osc. Spule) L202 (Ant. Spule)	• Auf max. Ausgang abgleichen.
3		1500kHz (400 Hz Modulat., 30%)	1500kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	CT201 (Osc. Trimmer) CT202 (Ant. Trimmer)	• Auf max. Ausgang abgleichen. • Schritt (2) und (3) sind zu wiederholen.
	UKW-ZF-ABGLEICH					
4	———	Kein Signal	Kein Empfang	Ein Gleichstromröhrenvoltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden (siehe Abb. 14)	T102 (Diskriminator FT)	• FM muting/FM mode. Schalter, auf "on/FM auto" stellen. • Den Kern von T102 so justieren, daß die gemessene Spannung im signallosen Modus 0mV im 300mV Bereich beträgt.
	UKW-HF-ABGLEICH					
5	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	87.35 MHz (400 Hz Modulat., 100%) Schwacher Eingang)	87.35 MHz (Frequenzmin.)	Oszillograph über den Ausgang "OUTPUT" schließen.	L4 (Osc. Spule)	• Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmertrisch wird. (Abb. 15) • **Die Einstellung von (5) ~ (8) wieder holen, bis die Frequenz mit der Skala übereinstimmt.**
6		90MHz (400 Hz Modulat., 100%) Schwacher Eingang	90MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	L1 (Ant. Spule) L2 (Det. Spule)	
7		108.25 MHz (400 Hz Modulat., 100%) Schwacher Eingang)	108.25 MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	CT1 (Osc. Trimmer)	
8		90 MHz (400 Hz Modulat., 100% Schwacher Eingang)	90 MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	T101 (IFT)	

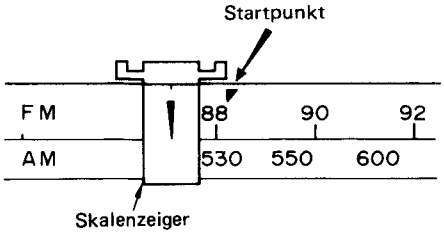
	AM/UKW MESSENDER		SKALENZEI-GEREIN-STELLUNG DES TUNER	ANZEIGEGEIRÄT (Röhrenvoltmeter order Oszillograph)	ABGLEICHSPUNKTE	BEMERKUNGEN
	ANSCHLUSS	FREQUENZ				
	ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	100 MHz (400 Hz Modulat., 100%)	100 MHz	Klirrfaktor-Meßbrücke über den Ausgang "OUTPUT" schließen.	T103 (Diskriminator IFT)	* FM muting/mode-Schalter auf "on/auto" stellen, dann in signalloser Mode den Schritt 4 feststellen. * Wenn Abweichung vorliegt, A (primäre Seite) von T102 wieder einstellen. * T103 Kern für minimale Verzerrung der rechten und linken Kanäle justieren.

	UKW-STEREO-DEKODER-ABGLEICH	
	UNTER VERWENDUNG EINES ZÄHLERS	ALTERNATIV-MEß METHODE
10	1. Unmodulierts Mono-Signal 100 MHz in das Gerät speisen. 2. FM muting/mode-Schalter auf "on/FM auto" stellen. 3. Zähler über einen Widerstand 100k ohm an TP301 schließen. 4. **VR301** auf 19 kHz ± 30 Hz einstellen.	1. Stereosignal entweder von einem Stereogenerator oder einem Sender einspeisen. 2. **VR301** so einstellen, bis die Stereolampe auf leuchtet. Schleifer von **VR301** sichern, wie in Abb. 16 gezeigt.

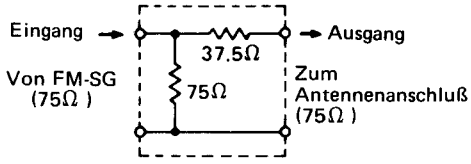
	STEREO-VERZERRUNGSABGLEICH					
11	Meßsender über eine Kunstantenne an den UKW-Antenneneinschließen. (Stereo-Pilotsignal 10% moduliert.)	100,1 MHz (400 Hz Modulat., 100%) L-Betriebsart.	100 MHz	Tiefpaßfilter (fc = 15 ~ 19 kHz) über Verzerrungsmesser an Ausgangsklemme "OUTPUT" des Gerätes schließen.	T101 (IFT)	* FM muting/mode-Schalter auf "on/auto" stellen. * Den schon eingestellten T101 erneut, innerhalb von ± 90° von der voreingestellten Kernposition einstellen, sodaß die Verzerrung des linken Kanäle minimalisiert wird.

• Zu justierende Punkte



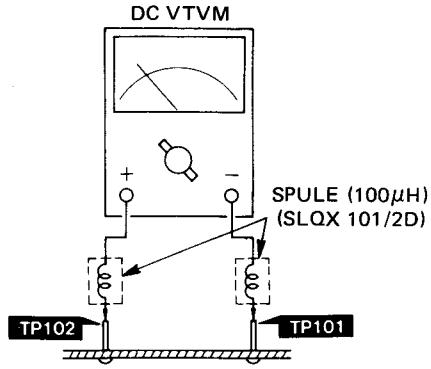


[Abb. 12]

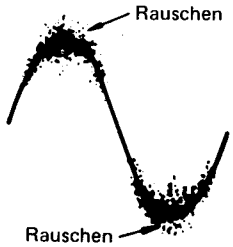


75Ω -FM-Kunstantenne

[Abb. 13]

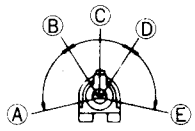


[Abb. 14]



AF-Ausgangswellenform

[Abb. 15]



VR301

A – B, D – E Stereo OFF-Position.
B – D Stereo ON-Position. (Anzeigebeleuchtung)
C Abgleichpunkt für den Pilotschaltkreis.

[Abb. 16]

■ REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

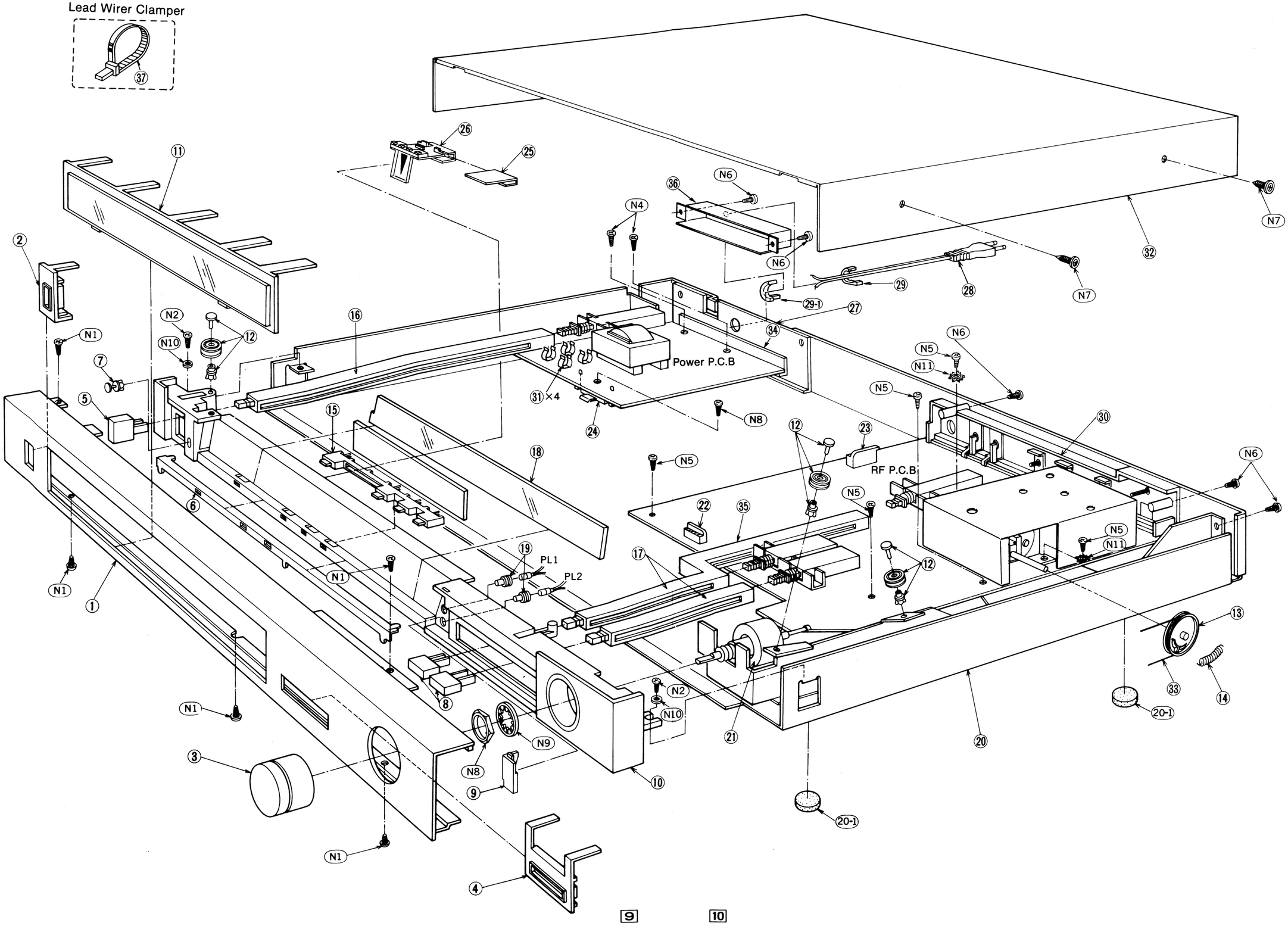
Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.
4. [K] - marked parts are used for black only, while ○ - marked parts are for silver type only.
5. Parts other than [K] - and ○ - marked are used for both black and silver types.
6. The parenthesized numbers in the columns of description stand for the quantity per set.

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGW3710PB	Panel, Front Ass'y (Silver)	(1)
1	[K]	SGW3710BA	Panel, Front Ass'y (Black)	(1)
2		SGX7221	Ornament, Power	(1)
3		SBN1091	Knob, Tuning	(1)
4		SGX7199	Ornament, Selector	(1)
5		SBC337–1	Botton, Power	(1)
6	○	SDH533–1	Ornament, Reflector (Silver)	(1)
6	[K]	SDH533–3	Ornament, Reflector (Black)	(1)
7		SHR401–1	Latch, Dial Scale	(1)
8		SBC433–1	Botton, Selector	(2)
9		SGX7225	Ornament, Front Sub Panel	(1)
10	○	SGX7195–4	Panel, Front Sub Panel (Silver)	(1)
10	[K]	SGX7195–3	Panel, Front Sub Panel (Black)	(1)
11		SGU257	Transparent Plate	(1)
12		SDR31	Pully, Dial	(3)
13		SDD31	Drum, Dial	(1)
14		SDSA4121	Spring, Dial	(1)
15		LN04181P–1	L.E.D. (with Holder)	(1)
16		SUB71	Connection Rod	(1)
17		SUB91	Connection Rod	(2)
18	○	SKD4375	Dial Scale	(1)
18	[K]	SKD4375–1	Dial Scale	(1)
19		SHG1615	Rubber, Lamp	(2)
20		SGPTZ25G1	Panel, Rear Ass'y (W/Feet)	(1)

Ref. No.		Part No.	Description	
20–1		SKL277	Foot	(4)
21		SDT8095–1	Tuning Shaft	(1)
22		SJS5421	Socket, 4P	(1)
23		SJS5627	Socket, 6P	(1)
24		SHE129–1	Holder, P.C.B.	(1)
25		SHP61	Spacer, Dial	(1)
26		SDP1173	Pointer, Dial	(1)
27		SGP3110–1	Panel, Sub Rear	(1)
28	⚠	SJA153	AC Cord	(1)
29		SHR127	Cord Bushing	(1)
29–1		RHR110	Bushing	(1)
30		SJF8503N	Terminal Board	(1)
31		SJT347	Crip, Fuse	(1)
32	○	SKCTZ25E	Cabinet, (Silver)	(1)
32	[K]	SKCTZ25KE	Cabinet, (Black)	(1)
33		SDZ051–2	Cord, Dial	1.8m
34		SMX595–1	Sheet	(1)
35		SUB129	Connection Rod	(1)
36		SGPTZ25G2	Cover Ass'y	(1)
37		SHR301	Clamper	(1)
SCREWS				
N1	S	XTB3+8BFZ	Tapping, Panel ⊕ 3 x 8	(5)
N2	S	XTV3+8C	Tapping, Ornament ⊕ 3 x 8	(2)
N3	S	XTB3+14BFN	Tapping, Power P.C.B ⊕ 3 x 14	(1)
N4	S	XTB3+8BFN	Tapping, Power P.C.B ⊕ 3 x 8	(2)
N5	S	XTB3+8BFN	Tapping, RF P.C.B. ⊕ 3 x 8	(5)
N6	S	XTB3+10BFZ	Tapping, Rear Panel ⊕ 3 x 10	(5)

Ref. No.		Part No.	Description	
N7	○	SNE2095–2	Cabinet	(4)
N7	[K]	SNE2095–3	Cabinet	(4)
NUTS				
N8	S	XNS11	ϕ11, Tuning Shaft	(1)
N9	S	XWD11B	ϕ11. Tuning Shaft	(1)
WASHERS				
N10	S	XWG3	ϕ3, Transparent	(2)
N11	S	XWC3B	ϕ3, with Detent	(2)
ACCESSORIES				
A1		SJP2249	Cord, Pin	(1)
A2		SSA901	Cord, FM Indoor	(1)
A4		SQF11289	Instruction Book	(1)
A5		SPB869–1	Loop Antenna Ass'y	(1)
A5–1		SSA605–1	Antenna	(1)
A5–2		SMA233	Holder	(1)
A5–3		SMA231	Holder	(1)
A5–5		XTN3+10AFZ	Tapping, ⊕ 3 x 10	(2)
PACKING PARTS				
P1	○	SPG3821	Carton Box (Silver)	(1)
P1	[K]	SPG3907	Carton Box (Black)	(1)
P2		SPS3493	Pad, Front	(1)
P3		SPS3495–3	Pad, Rear	(1)
P4	○	SPP697	Polyethylene Bag	(1)
P4	[K]	SPP647	Polyethylene Bag	(1)

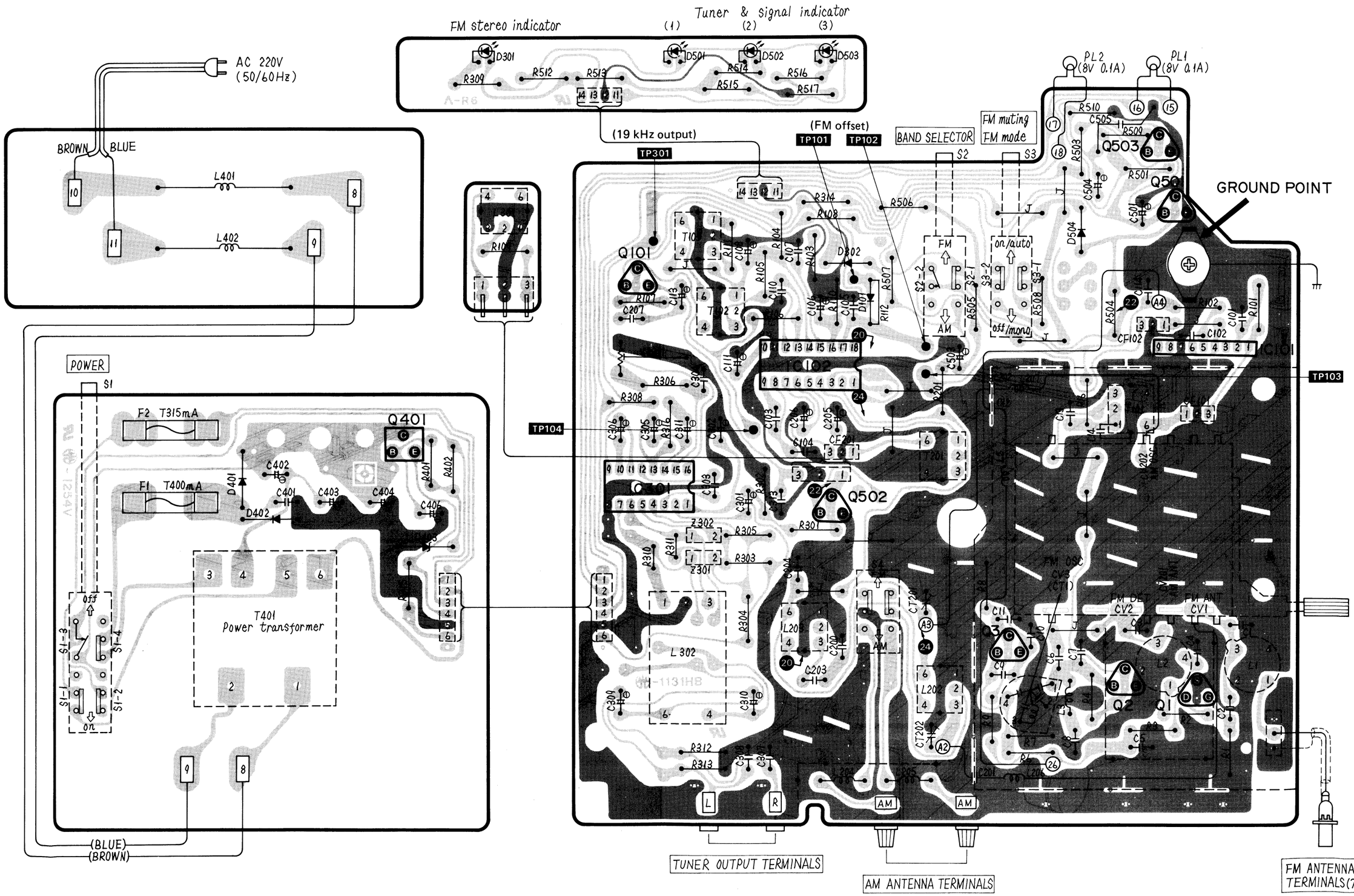
■ EXPLODED VIEWS



9 10

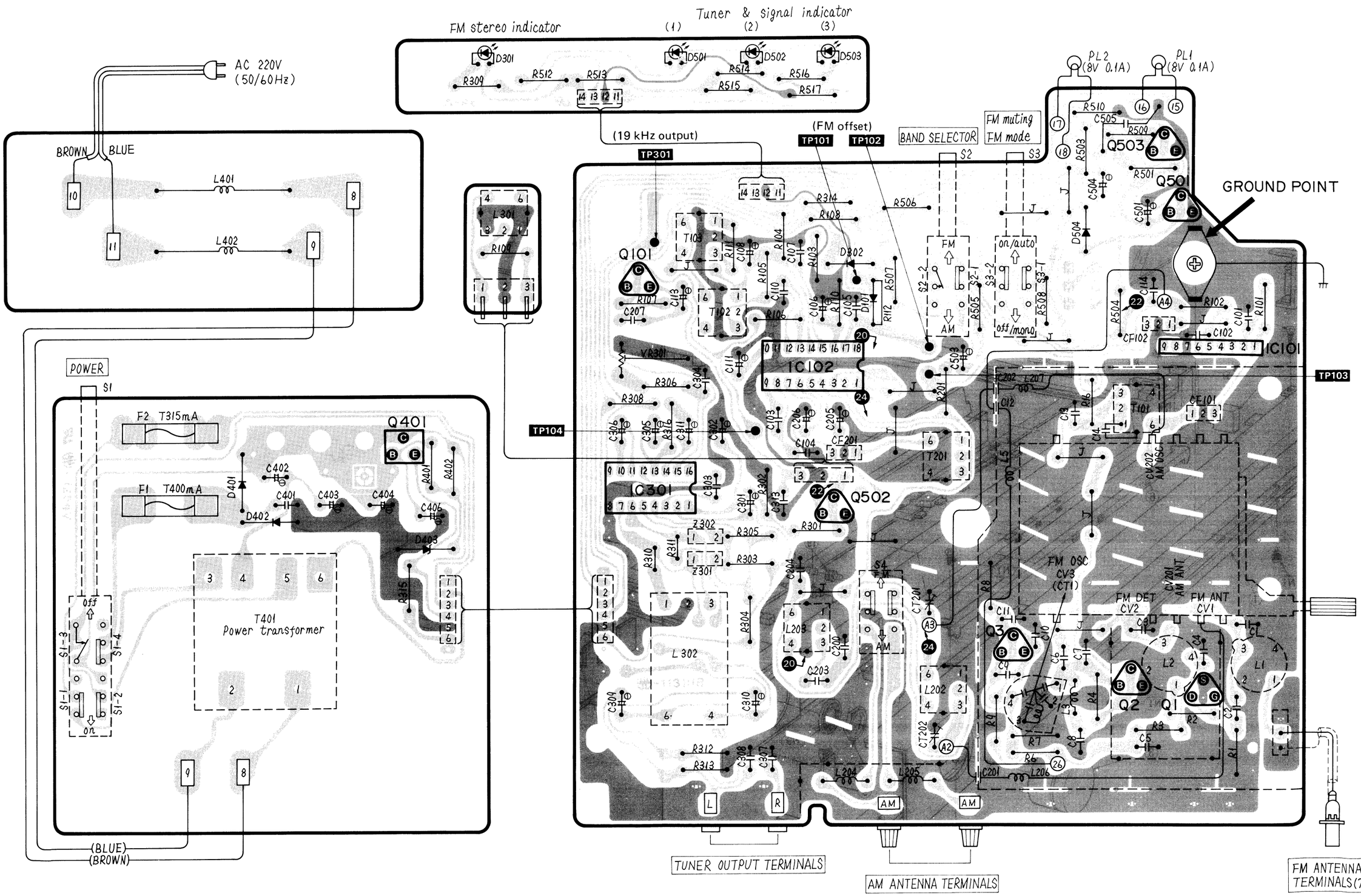
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

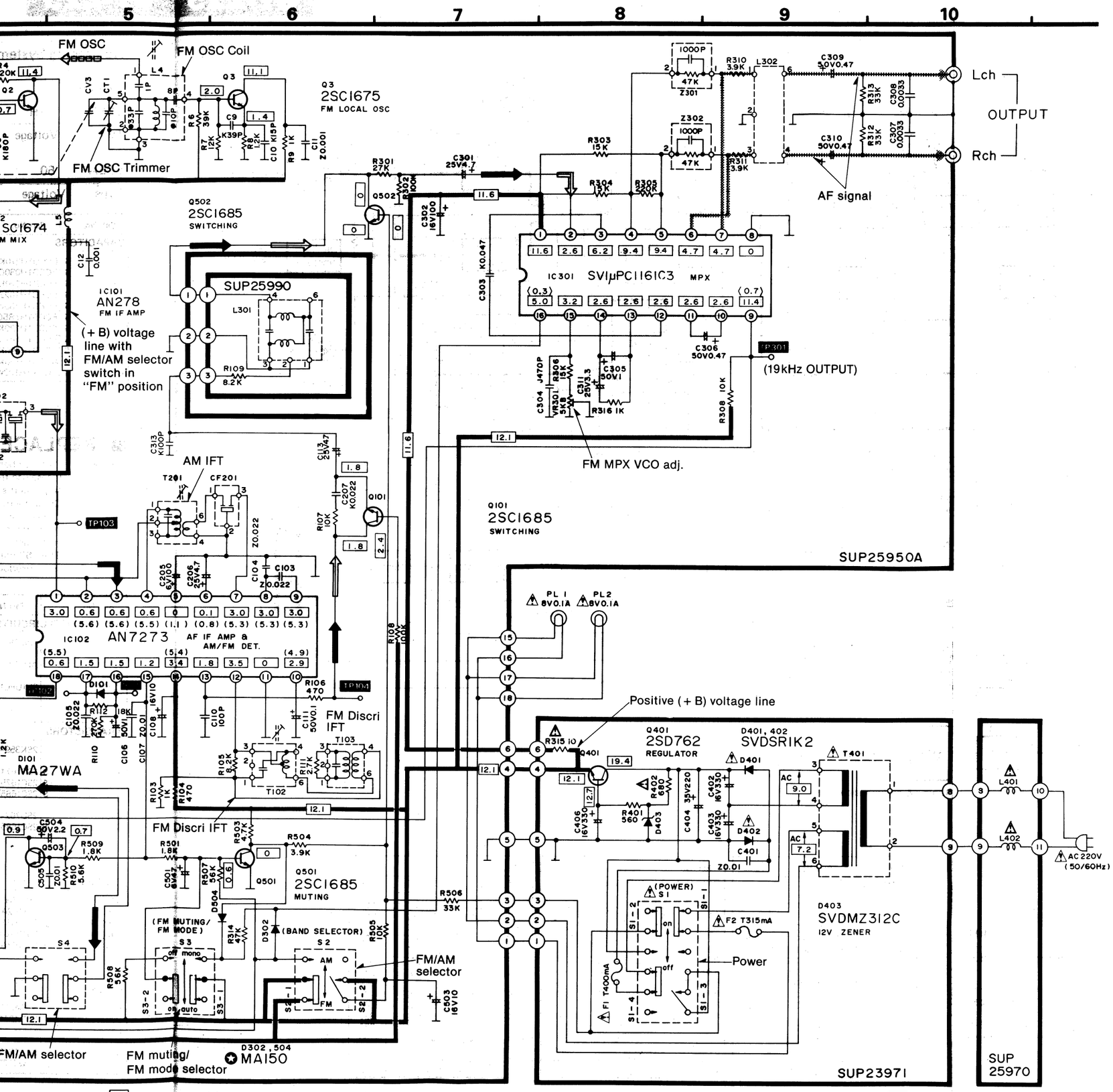


■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines



FM signal line
FM ANT (75Ω)
FM Antenna coil
AM ANT
Loop ant.
FM RF DET Coil
Q1 2SK359 FM RF AMP
FM OSC
FM OSC Coil
FM OSC Trimmer
Q3 2SC1675 FM LOCAL OSC
Q2 2SC1674 FM MIX
IC101 AN278 FM IF AMP
(+B) voltage line with FM/AM selector switch in "FM" position
SUP25990
Q502 2SC1685 SWITCHING
IC301 SVIμPC1161C3 MPX
AF signal
Lch
Rch
OUTPUT
TP301
(19kHz OUTPUT)
FM MPX VCO adj.
Q101 2SC1685 SWITCHING
SUP25950A
AM IFT
AM Antenna coil
IC102 AN7273 AF IF AMP & AM/FM DET.
FM Discri IFT
DI01 MA27WA
AM OSC trimmer
AM OSC coil
Q503 2SC1685 DRIVE
Q501 2SC1685 MUTING
FM stereo ind. Tuner & Signal ind.
SUP25950B
FM stereo and signal indicator assembly (Part NO LN04181P-1)
D301 LN224RP
D501~503 LN424YP
FM/AM selector
FM muting/ FM mode selector
D302,504 MA150
Positive (+B) voltage line
Q401 2SD762 REGULATOR
D401,402 SVDSRIK2
D403 SVDMZ312C 12V ZENER
(POWER) S1
F2 T315mA
Power
SUP23971
SUP 25970
13
14



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■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

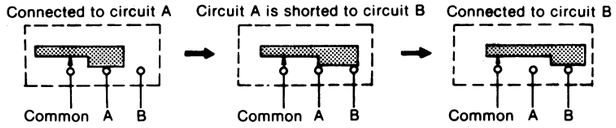
Notes:

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

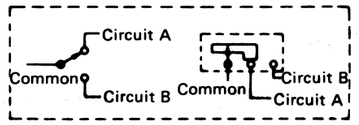
1. **S1** : Power source switch in **"on"** position.
2. **S2, 4**: Band selector switch in **"FM"** position
   FM ⟷ AM
3. **S3** : FM muting/FM mode selector switch in **"on/FM auto"** position.
4. Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the chassis taken values, depending on the internal impedance of the DC circuit tester.
   * Figures in ☐ stand for DC voltage in FM/AM signal reception mode.
   * Figures in ⟨ ⟩ stand for DC voltage in FM stereo signal reception mode.
   * Figures in ( ) stand for DC voltage with the band selectors circuit set at AM.
5. Signal lines
   ⇨/▭▭▭⇨ FM signal ▬▬ Positive (+B) voltage line
   ▒▒▒ Audio frequency signal ➡/▬▬➡ AM signal
6. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
7. Power switch (S1-3) and band selector switch (S2-2) is a muting switch, which works to short the circuit only when the switch is turned on or off.

Shorting Switch

This unit uses a shorting switch. As illustated below, the circuit is shorted to the next circuit without being opened.
In the circuit diagram, the shaded area represents the common terminal.

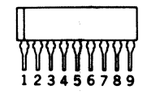


An example of circuit diagram



• Terminal guide of transistors, diodes and IC's

AN278



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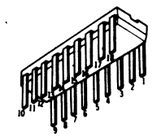
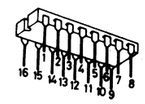


AN7470



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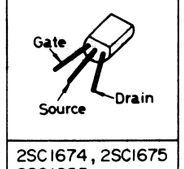
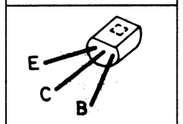
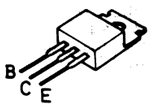


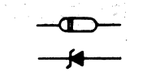
2SC1674, 2SC1675
2SC1685

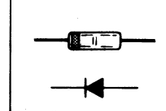
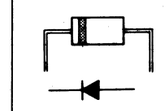
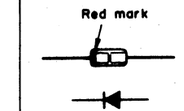
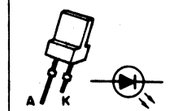


2SD762



SVDMZ□□□□



MA150TA	SVDSRIK2	MA27WA	LN224RP, LN424YP
			

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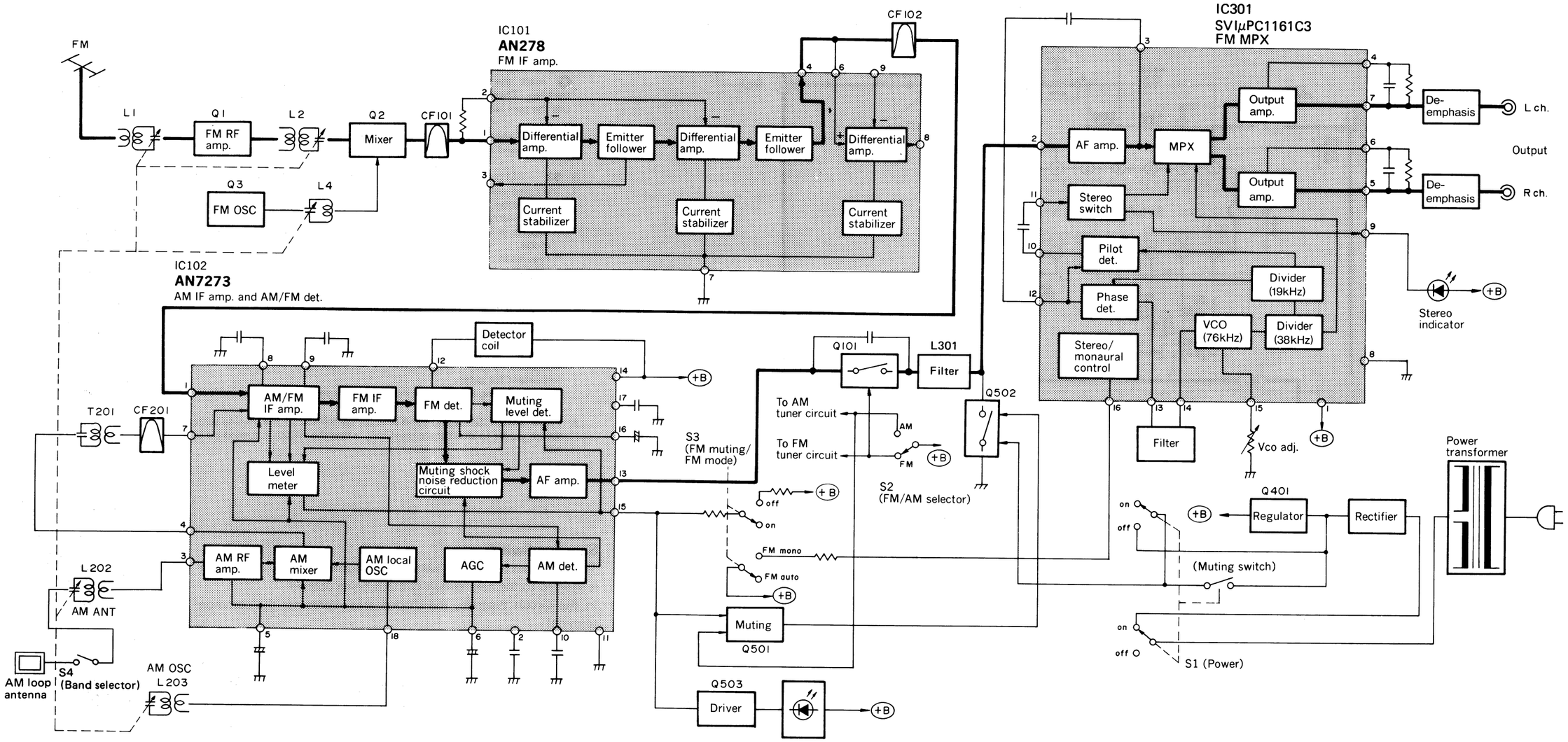
ST-Z25 ST-Z25

■ BLOCK DIAGRAM



■ RESISTOR & CAPACITOR

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these compoinents use only manufacturer's specified parts.
3. Bracketed indicators in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ± 5%

Ref. No.		Part No.	Value
RESISTORS			
R1	S	ERD25TJ104	100k
R2	S	ERD25FJ220	22
R3	S	ERD25FJ221	220
R4	S	ERD25TJ824	820k
R6	S	ERD25TJ393	39k
R7	S	ERD25TJ123	12k
R8	S	ERD25FJ122	1.2k
R9	S	ERD25FJ102	1k
R10	S	ERD25FJ221	220
R101	S	ERD25FJ331	330
R102	S	ERD25FJ821	820
R103	S	ERD25FJ102	1k
R104	S	ERD25FJ471	470
R105	S	ERD25FJ822	8.2k
R106	S	ERD25FJ471	470
R107	S	ERD25FJ103	10k
R108	S	ERD25TJ104	100k
R109	S	ERD25FJ822	8.2k
R110	S	ERD25TJ274	270k
R111	S	ERD25FJ272	2.7k
R112	S	ERD25TJ183	18k
R201	S	ERD25FJ122	1.2k
R301	S	ERD25TJ273	27k
R302	S	ERD25TJ104	100k
R303, 304	S	ERD25TJ153	15k
R305	S	ERD25TJ224	220k
R306	S	ERD25TJ153	15k
R308	S	ERD25FJ103	10k
R309	S	ERD25FJ152	1.5k
R310, 311	S	ERD25FJ392	3.9k
R312, 313	S	ERD25TJ333	33k
R314		ERD25TJ473	47k
R315	⚠S	ERD25FJ100	10
R316	S	ERD25FJ102	1k
R401	S	ERD25FJ561	560
R402	⚠S	ERD25FJ681	680
R501	S	ERD25FJ182	1.8k
R503	S	ERD25FJ472	4.7k
R504	S	ERD25FJ392	3.9k
R505	S	ERD25FJ103	10k
R506	S	ERD25TJ333	33k
R507, 508	S	ERD25TJ563	56k
R509	S	ERD25FJ182	1.8k
R510	S	ERD25FJ562	5.6k
R512	S	ERD25FJ821	820
R513	S	ERD25FJ331	330
R514	S	ERD25FJ151	150
R515	S	ERD25FJ121	120
R516	S	ERD25FJ120	12
R517	S	ERD25FJ102	1k

Numbering Sys

Example

ECKD	1H
Type	Voltag

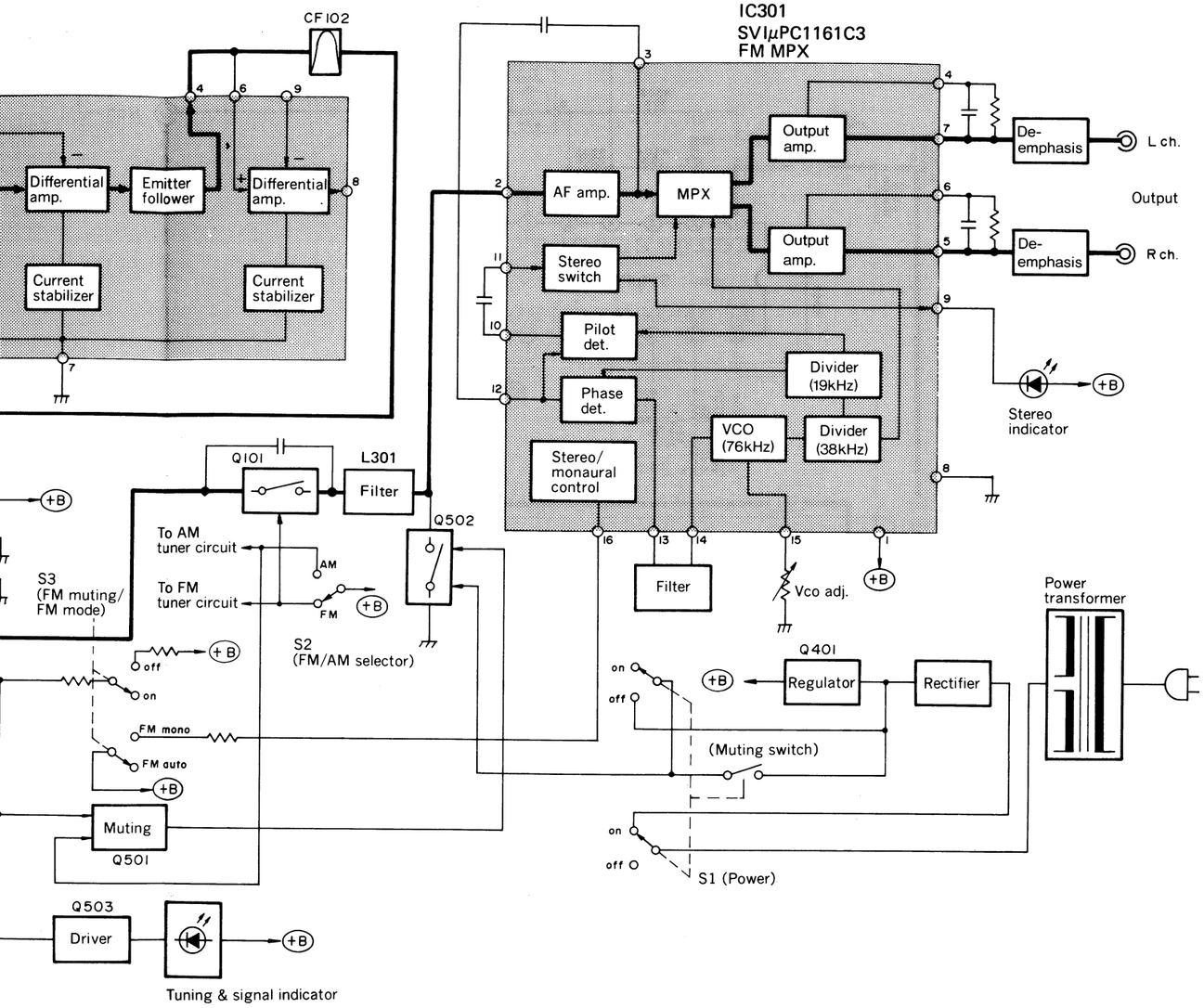
ECEA	50
Type	Voltage

Ref. No.		Part N
CAPACITORS		
C1	S	ECCD1H
C2	S	ECCD1H
C3	S	ECCD1H
C4	S	ECKD1H
C5	S	ECKD1H
C6	S	ECCD1H
C7	S	ECCD1H
C8	S	ECCD1H
C9	S	ECCD1H
C10	S	ECCD1H
C12	S	ECKY1H

■ REPLAC

Notes:
1. Part num Please us
2. Importa Compon characte When re manufac
3. The "S" from pr

Ref. No.		P
INTEGRATED CIRC		
IC101		AN2
IC102		AN7
IC301		SVIL
TRANSISTORS		
Q1		2SK3
Q2	S	2SC1
Q3	S	2SC1
Q101	S	2SC1
Q401		2SD7
Q501 ~ 503	S	2SC1
DIODES		
D101		MA2
D302	S	MA1
D401, 402	⚠	SVD
D403		SVD
D504	S	MA1
COILS		
L1		SLA
L2		SLD
L3		SLQ
L4		SLO
L5		SLQ



Ref. No.		Part No.	Value
RESISTORS			
R1	S	ERD25TJ104	100k
R2	S	ERD25FJ220	22
R3	S	ERD25FJ221	220
R4	S	ERD25TJ824	820k
R6	S	ERD25TJ393	39k
R7	S	ERD25TJ123	12k
R8	S	ERD25FJ122	1.2k
R9	S	ERD25FJ102	1k
R10	S	ERD25FJ221	220
R101	S	ERD25FJ331	330
R102	S	ERD25FJ821	820
R103	S	ERD25FJ102	1k
R104	S	ERD25FJ471	470
R105	S	ERD25FJ822	8.2k
R106	S	ERD25FJ471	470

Ref. No.		Part No.	Value
R107	S	ERD25FJ103	10k
R108	S	ERD25FJ104	100k
R109	S	ERD25FJ822	8.2k
R110	S	ERD25TJ274	270k
R111	S	ERD25FJ272	2.7k
R112	S	ERD25TJ183	18k
R201	S	ERD25FJ122	1.2k
R301	S	ERD25TJ273	27k
R302	S	ERD25TJ104	100k
R303, 304	S	ERD25TJ153	15k
R305	S	ERD25TJ224	220k
R306	S	ERD25TJ153	15k
R308	S	ERD25FJ103	10k
R309	S	ERD25FJ152	1.5k
R310, 311	S	ERD25FJ392	3.9k
R312, 313	S	ERD25TJ333	33k
R314		ERD25TJ473	47k
R315	⚠S	ERD25FJ100	10

Ref. No.		Part No.	Value
R316	S	ERD25FJ102	1k
R401	S	ERD25FJ561	560
R402	⚠S	ERD25FJ681	680
R501	S	ERD25FJ182	1.8k
R503	S	ERD25FJ472	4.7k
R504	S	ERD25FJ392	3.9k
R505	S	ERD25FJ103	10k
R506	S	ERD25TJ333	33k
R507, 508	S	ERD25TJ563	56k
R509	S	ERD25FJ182	1.8k
R510	S	ERD25FJ562	5.6k
R512	S	ERD25FJ821	820
R513	S	ERD25FJ331	330
R514	S	ERD25FJ151	150
R515	S	ERD25FJ121	120
R516	S	ERD25FJ120	12
R517	S	ERD25FJ102	1k

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type		Voltage		Tolerance
		ECEA Type	Others	
ECEA : Electrolytic		1A : 10V	1H : 50V DC	C : ± 0.25pF
ECCD : Ceramic		1C : 16V	1 : 100V	J : ± 5%
ECKD : Ceramic		1H : 50V		K : ± 10%
ECQM : Polyester		50Z : 50V		Z : +80%, –20%
ECQP : Polypropylene				
ECCL : Ceramic (Through type)				

Ref. No.		Part No.	Value
CAPACITORS			
C1	S	ECCD1H270KC	27p
C2	S	ECCD1H030CC	3p
C3	S	ECCD1H220KC	22p
C4	S	ECKD1H102ZF	0.001
C5	S	ECKD1H103ZF	0.01
C6	S	ECCD1H1R5CC	1.5p
C7	S	ECCD1H120KC	12p
C8	S	ECCD1H181K	180p
C9	S	ECCD1H390KC	39p
C10	S	ECCD1H150KC	15p
C12	S	ECKY1H102WED	0.001

Ref. No.		Part No.	Value
C13	S	ECQM1H103JZ	0.01
C14	S	ECKD1H103ZF	0.01
C201	S	ECCL1H070FY	7p
C202	S	ECCL1H120KY	12p
C203		ECQP1361JZ	360p
C204	S	ECKD1H223ZF	0.022
C205	S	ECEA1AS101	100
C206	S	ECEA25Z4R7	4.7
C207	S	ECQM1H223JZ	0.022
C301	S	ECEA25Z4R7	4.7
C302	S	ECEA1ES101	100
C303	S	ECQM1H473JZ	0.047
C304		ECQP1471JZ	470p

Ref. No.		Part No.	Value
C11	S	ECKD1H102ZF	0.001
C101, 102	S	ECKD1H103ZF	0.01
C103, 104	S	ECKD1H223ZF	0.022
C105	S	ECKD1H223ZF	0.022
C106	S	ECEA50Z1	1
C107	S	ECKD1H103ZF	0.01
C108	S	ECEA1HS100	10
C110	S	ECCD1H101K	100p
C111	S	ECEA50ZR1	0.1
C113	S	ECEA25Z4R7	4.7
C114	S	ECKD1H223ZF	0.022
C200	S	ECCD1H030CC	3p
C305	S	ECEA50Z1	1

Ref. No.		Part No.	Value
C306	S	ECEA50ZR47	0.47
C307, 308	S	ECQM1H332JZ	0.033
C309, 310	S	ECEA50ZR47	0.47
C311	S	ECEA50Z3R3	3.3
C313	S	ECCD1H101K	100p
C401	S	ECKD1H103ZF	0.01
C402, 403	S	ECEA1CS331	330
C404	S	ECEA1VS221	220
C406	S	ECEA1CS331	330
C501	S	ECEA1AS470	47
C503	S	ECEA1HS100	10
C504	S	ECEA50Z2R2	2.2
C505	S	ECKD1H103ZF	0.01

■ REPLACEMENT PARTS LIST.....Electrical Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN278	FM IF Amplifier
IC102	AN7273	FM/AM Detector
IC301	SVIUPC1161C3	FM MPX
TRANSISTORS		
Q1	2SK359–D	FM RF Amplifier
Q2 S	2SC1674–M	FM Mixer
Q3 S	2SC1675–L	FM OSC
Q101 S	2SC1685–Q	Switching, Driver
Q401	2SD762–O	Regulator
Q501 ~ 503 S	2SC1685–Q	Switching, Driver
DIODES		
D101	MA27W–A	Detector
D302 S	MA162A	Switching
D401, 402 ⚠	SVDSR1K2	Rectifier
D403	SVDMZ312C	12V, Zener
D504 S	MA162A	Switching
COILS		
L1	SLA4P75–P	FM Antenna
L2	SLD4P71–P	FM Detector
L3	SLQY15G5–O	Choke
L4	SLO4P125–P	FM OSC
L5	SLQZ12G1–D	Choke

Ref. No.	Part No.	Description
L202	SLA2C3–P	AM Antenna
L203	SLO2C1–P	AM OSC
L204, 205, 206, 207	SLQZ12G1–D	Choke
L301	SLM1C69–P	Filter
L302	SLMA1Z3–Z	Filter
L401, 402 ⚠	SLQX400–D	Choke
TRANSFORMERS		
T101	SLI4C109	FM IFT
T201	SLI2C139–M	AM IFT
T102	SLI4C535–Z	FM IFT
T103	SLI4C537–Z	FM IFT
T401 ⚠	SLT5K123	Power Source
FUSES		
F1 ⚠	XBA2C04TR0	250V, T 400mA
F2 ⚠	XBA2C03TR0	250V, T 315mA
SWITCHES		
S1 ⚠	SSH1043	Power
S2, 3	SSH2031	Band Selector & FM Muting/ FM mode selector
S4	SSH1075	Band Selector

Ref. No.	Part No.	Description
LAMPS		
PL1, 2 ⚠	XAMS3S150	8V, 0.1A
COMPONENT COMBINATIONS		
Z301, 302	EXRP102K473T	0.001μF x 1 47kΩ x 1
VARIABLE RESISTORS		
VR301 S	EVTS3MA00B53	FM MPX, 5kΩ (B)
VARIABLE CAPACITORS		
CT1, VC1 ~ 3 VC201 ~ 202	ECV5MD34X93G	Tuning Gang
CT201, 202	SVCTZ03T110F	AM Antenna
CERAMIC FILTERS		
CF101, 102	SVFT107MS–A	10.700 MHz (Red)
	SVFT107MS–B	10.675 MHz (Blue)
	SVFT107MS–C	10.725 MHz (Orange)
	SVFT107MS–D	10.650 MHz (Black)
	SVFT107MS–E	10.750 MHz (White)
CF201	SVFSFU450B3	AM 450 kHz (Use pair ranks as same as CF101 and CF102)

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